



(51) International Patent Classification:

H04L 41/5025 (2022.01) H04L 67/52 (2022.01)  
H04L 41/0896 (2022.01) H04W 48/18 (2009.01)

(21) International Application Number:

PCT/US2021/065515

(22) International Filing Date:

29 December 2021 (29.12.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/132,716 31 December 2020 (31.12.2020) US

(71) Applicant: **LEVEL 3 COMMUNICATIONS, LLC**  
[US/US]; 1025 Eldorado Blvd., Broomfield, Colorado  
80021 (US).

(72) Inventors: **SAVILL, Timothy Paul**; c/o Level 3 Communications, LLC, 1025 Eldorado Boulevard, Broomfield, Colorado 80021 (US). **MCREYNOLDS, Christopher**; c/o Level 3 Communications, LLC, 1025 Eldorado Boulevard, Broomfield, Colorado 80021 (US). **RITCHIE, Austin**; c/o Level 3 Communications, LLC, 1025 Eldorado Boulevard, Broomfield, Colorado 80021 (US).

(74) Agent: **LEIBOLD, Gregory D.**; LEWIS ROCA ROTHGERBER CHRISTIE LLP, P.O. Box 29001, Glendale, California 91209-9001 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO,

(54) Title: SYSTEMS AND METHODS FOR OPTIMIZING NETWORK CHARACTERISTICS

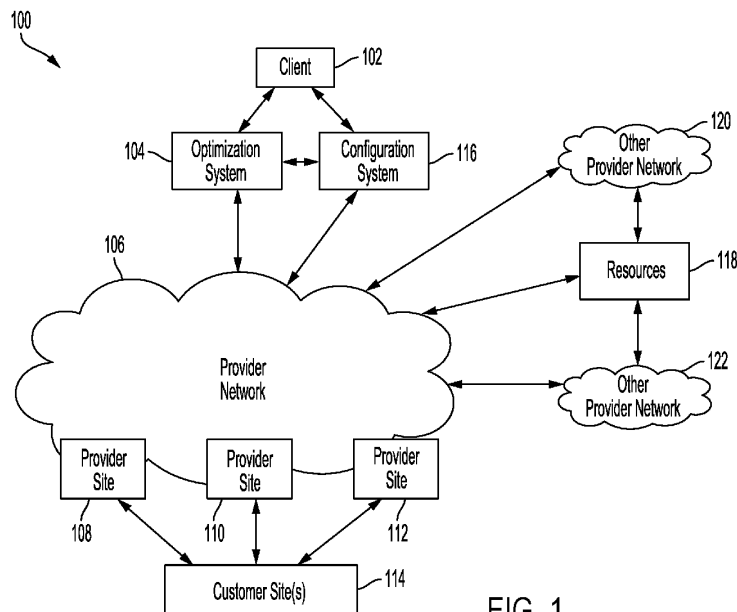


FIG. 1

(57) Abstract: Systems and methods for recommending and implementing computing services at a provider network site are provided. A provider network may comprise multiple provider sites, such as edge computing sites. Edge computing sites may not be uniform – e.g., they may differ in computing capability, security certification, capacity for expansion, data storage availability, type of network connectivity, etc. An optimization system uses both service information and optimization criteria to determine one or more optimized provider site(s) for hosting a computing service. Further, service information and optimization criteria may be stored and updated to allow the computing service to be dynamically moved in response to a change event, such as a site failure or a determination that an improvement metric exceeds a threshold for a minimum period of time.

[Continued on next page]

NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW,  
SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report (Art. 21(3))